

Great Glaciers

Introduction

What are glaciers and how do they form? What effects do glaciers have on the land? In this demonstration, a simulated glacier will be constructed and used to help answer these questions.

Concepts

- Glaciers
- Erosion
- Earth movement

Materials

- Adjustable support (stacked blocks of wood work well)
- Container to catch overflow water
- Ice block (at least 15 cm × 9 cm × 3 cm)
- Mixture of moist soil containing small rocks or pebbles
- Stream table, soil planting tray or large aluminum roasting pan (with one short end cut out)

Safety Precautions

Although this demonstration is considered nonhazardous, always follow appropriate laboratory safety guidelines. Use caution with wet surfaces, as they can become slippery.

Preparation

Prepare the ice block the day before the demonstration. Set up the soil tray in a steeply sloping position, visible to all. Fill the tray with the moist soil mixture. If a roasting pan is used, support it from below with a rigid board, etc. It may be helpful to do a practice demonstration before demonstrating it in front of the class.

Procedure

1. Place the ice block at the high end of the soil tray on top of the soil (see Figure 1).
2. Place the overflow container at the lower end of the tray to catch the water.
3. The ice will melt and water, carrying soil with it, will flow down the tray. The glacier may also move if the slope is great enough.

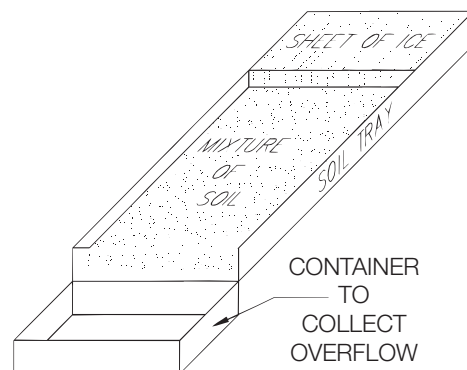


Figure 1.

Disposal

Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures, and review all federal, state and local regulations that may apply, before proceeding. The soil and unmelted ice may be emptied outside. The other materials may be saved for future use.

Tips

- If a sunny window is available, set this demonstration up in the sun to speed things along.
- Allow at least five or ten minutes for this demonstration to take place.
- If the ice block moves down the slope of the tray, the ice block may be picked up to observe “plucked” materials.

Discussion

Glaciers are composed of fallen snow that accumulates over time and compresses into thickened ice masses. As the snow piles up, ice begins to form on the bottom of the snow mass. As the mass of the pile becomes greater, the ice on the bottom of the snow mass begins to melt and the pile begins to slide. At this point the snow mass is known as a glacier.

In nature, glaciers can move quickly or slowly downslope, depending on the angle of slope, changes in atmospheric temperature and glacial load. As a glacier moves over the land, it “plucks” rock and soil debris from the surface. These plucked rocks become embedded into the ice and act as cutting tools which in turn smooth and polish the rock surfaces beneath the moving glacier. From time to time, the glacier will drop rocks and sediments to produce glacial landforms.

Glacial deposits are generally grouped into two classes: till and outwash. Till occurs when different shaped sediments (such as sand, clay and boulders) are deposited from a glacier. The second type of deposit is known as outwash. Outwash is a glacial deposit of sediment left from the melting ice of a glacier. The melted water from the glacier carries sediments and creates channels in the same manner as a river or stream.

Connecting to the National Standards

This laboratory activity relates to the following National Science Education Standards (1996):

Unifying Concepts and Processes: Grades K–12

- Evidence, models, and explanation
- Constancy, change, and measurement

Content Standards: Grades 5–8

- Content Standard D: Earth Science, structure of the Earth system
- Content Standard F: Science in Personal and Social Perspectives; natural hazards

Content Standards: Grades 9–12

- Content Standard D: Earth and Space Science, geochemical cycles
- Content Standard F: Science in Personal and Social Perspectives, environmental quality, natural and human-induced hazards

Reference

Gross, G.; Colangelo, E.; Holzer, M. *A Demo A Day™—A Year of Earth Science Demonstrations*; Flinn Scientific Inc.: Batavia, IL, 2001; p 147.

Materials for *Great Glaciers* are available from Flinn Scientific, Inc.

Catalog No.	Description
AB1456	Planting Tray
AP5116	Steam Table
AP5944	A Demo A Day™—A Year of Earth Science Demonstrations

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.